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2 SYSTEM AND METHOD FOR PROVIDING A HISTORY
3 LIST OF EXISTING IMAGING COMPOSITIONS

4 The present invention generally relates to an improved system
5 and method for providing a history of existing imaging compositions that can
6 be reactivated. More specifically, it relates to an improved system and method
7 for providing a history of existing imaging compositions that can be retrieved
8 by users of a client computer.

9 End-users of computer systems often desire a history of their
10 previous actions or requests. For example, most web browsers, such as Internet
11 Explorer®, generally keep a history of previously visited web sites. Microsoft
12 Windows®, a computer operating system, also provides a list of recently
13 accessed documents. However, the history provided by these applications does
14 not relate to previously printed imaging information, such as when a set of data
15 is printed or faxed.

1 Currently, various personal computer based fax solutions and
2 standalone fax solutions keep a history of previously sent faxes. However, the
3 only function provided by these history lists is more or less simply a record
4 keeping system. The previously sent faxes includes simple function, such as
5 resenting the fax to the specified destination. As a result, its design and
6 functionality cannot be applied to more complex systems that are implemented
7 using the Internet. The necessity for a history relating to printed imaging
8 information that gives the user more options and functionality will become
9 more important as the computers become more integrated with the Internet.

10 A history of the printed imaging data is extremely useful since
11 the printed imaging data can include several images coming from distinct
12 sources, which makes it broader than the traditional notion of a print job
13 relating to peripheral devices, such as a printer. The printed imaging data
14 serviced as a single unit will be referenced by an "imaging composition," which
15 contains links to each imaging data that was serviced in the single unit. For
16 example, a printed imaging data can include a letterhead image, a letter image,
17 and a postage image. In this example, a user can compose a letter (the letter
18 imaging data), and add the company's letterhead (the letterhead imaging data)
19 to the letter. Once the letter is ready, the user can then purchase a digital
20 postage (the postage imaging data) over the Internet for the letter. It should be
21 understood that the term "imaging data" as used herein refers digital data
22 capable of being represented as two dimensional graphics, such as a Portable
23 Document Format ("PDF") file or a Joint Photographic Experts Group
24 ("JPEG") file.

25 BRIEF SUMMARY OF THE INVENTION

1 The present invention generally relates to an improved system
2 and method for providing a history of previous imaging compositions. The
3 system and method provide a way to track existing imaging compositions that
4 can be utilized by web services at a later time.

5 The present invention provides an improved for providing a
6 history list of existing imaging compositions having links to imaging data that
7 is serviced as a single unit that can be later retrieved by the user associated with
8 the history list. The present invention includes a history list of existing
9 imaging compositions, which has links to all imaging data that are serviced as a
10 single unit. The present invention further includes a personal imaging
11 repository having a composition store for storing the history list and the
12 existing imaging compositions, and it acts as an exchange infrastructure
13 between the imaging data and available web services on the Internet. The
14 composition store of the personal imaging repository also maintains the history
15 list.

16 The present invention further provides a method that includes the
17 steps of receiving a new imaging composition from a network service, saving
18 the new imaging composition to the composition store, adding the new imaging
19 composition to the history list, and providing the history list to the user
20 associated with the personal imaging repository responsive to a request for the
21 history list.

22 DESCRIPTION OF THE DRAWINGS

23 FIGURE 1 is an architectural diagram of a client-server network
24 system in which the present invention can be implemented;

25 FIG. 2 is an architectural diagram of a second client-server
26 network system in which the present invention can be implemented;

1 FIG. 3 illustrates an exemplary display image of the history list;
 2 FIG. 4 illustrates an exemplary display of the image data from a
 3 selected imaging composition that is opened by the user;
 4 FIG. 5 is a flowchart illustrating the preferred subroutine of a
 5 history list maintenance process; and,
 6 FIG. 6 is a flowchart illustrating the preferred subroutine of a
 7 request process.

8 GLOSSARY OF TERMS AND ACRONYMS

9 The following terms and acronyms are used throughout the
 10 detailed description:

11 Client-Server. A model of interaction in a distributed system in
 12 which a program at one site sends a request to a program at another site and
 13 waits for a response. The requesting program is called the "client," and the
 14 program which responds to the request is called the "server." In the context of
 15 the World Wide Web (discussed below), the client is a "Web browser" (or
 16 simply "browser") which runs on the computer of a user; the program which
 17 responds to browser requests by serving Web pages, or other types of Web
 18 content, is commonly referred to as a "Web server."

19 Composition store. Composition store refers to a network service
 20 or a storage device for storing imaging composition(s) that can be accessed by
 21 the user or other web services.

22 Content. A set of executable instructions that is served by a
 23 server to a client and that is intended to be executed by the client so as to
 24 provide the client with certain functionality. Web content refers to content that
 25 is meant to be executed by operation of a Web browser. Web content,
 26 therefore, may non-exhaustively include one or more of the following: HTML

1 code, SGML code, XML code, XSL code, CSS code, Java applet, JavaScript
2 and C-"Sharp" code.

3 Exchange infrastructure. An exchange infrastructure is a
4 collection of services distributed throughout a network that stores imaging data
5 associated with a particular user through a user profile.

6 Hyperlink. A navigational link from one document to another,
7 from one portion (or component) of a document to another, or to a Web
8 resource, such as a Java applet. Typically, a hyperlink is displayed as a
9 highlighted word or phrase that can be selected by clicking on it using a mouse
10 to jump to the associated document or document portion or to retrieve a
11 particular resource.

12 Hypertext System. A computer-based informational system in
13 which documents (and possibly other types of data entities) are linked together
14 via hyperlinks to form a user-navigable "web."

15 Imaging composition. An imaging composition comprises links
16 to imaging data serviced as a single unit.

17 Imaging data. Imaging data refers to digital data capable of being
18 represented as two dimensional graphics, such as a Portable Document Format
19 ("PDF") file or a Joint Photographic Experts Group ("JPEG") file.

20 Imaging data store. Imaging data store refers to a network
21 service or a storage device for storing imaging data that can be accessed by the
22 user or other network services. The imaging data store preferably accepts the
23 imaging data in multiple standard file formats, and the imaging data is
24 converted into these file formats when necessary depending on the
25 implementation.

26 Internet. A collection of interconnected or disconnected networks
27 (public and/or private) that are linked together by a set of standard protocols

1 (such as TCP/IP and HTTP) to form a global, distributed network. (While this
2 term is intended to refer to what is now commonly known as the Internet, it is
3 also intended to encompass variations which may be made in the future,
4 including changes and additions to existing standard protocols.)

5 World Wide Web ("Web"). Used herein to refer generally to both
6 (i) a distributed collection of interlinked, user-viewable hypertext documents
7 (commonly referred to as Web documents or Web pages) that are accessible via
8 the Internet, and (ii) the client and server software components which provide
9 user access to such documents using standardized Internet protocols. Currently,
10 the primary standard protocol for allowing applications to locate and acquire
11 Web documents is HTTP, and the Web pages are encoded using HTML.
12 However, the terms "Web" and "World Wide Web" are intended to encompass
13 future markup languages and transport protocols which may be used in place of
14 (or in addition to) HTML and HTTP.

15 Web Site. A computer system that serves informational content
16 over a network using the standard protocols of the World Wide Web.
17 Typically, a Web site corresponds to a particular Internet domain name, such as
18 "HP.com," and includes the content associated with a particular organization.
19 As used herein, the term is generally intended to encompass both (i) the
20 hardware/software server components that serve the informational content over
21 the network, and (ii) the "back end" hardware/software components, including
22 any non-standard or specialized components, that interact with the server
23 components to perform services for Web site users. Importantly, a Web Site
24 can have additional functionality, for example, a Web site may have the ability
25 to print documents, scan documents, etc.

26 HTML (HyperText Markup Language). A standard coding
27 convention and set of codes for attaching presentation and linking attributes to

1 informational content within documents. (HTML 2.0 is currently the primary
2 standard used for generating Web documents.) During a document authoring
3 stage, the HTML codes (referred to as "tags") are embedded within the
4 informational content of the document. When the Web document (or HTML
5 document) is subsequently transferred from a Web server to a browser, the
6 codes are interpreted by the browser and used to display the document.
7 Additionally in specifying how the Web browser is to display the document,
8 HTML tags can be used to create links to other Web documents (commonly
9 referred to as "hyperlinks"). For more information on HTML, see Ian S.
10 Graham, The HTML Source Book, John Wiley and Sons, Inc., 1995 (ISBN
11 0471-11894-4).

12 HTTP (HyperText Transport Protocol). The standard World
13 Wide Web client-server protocol used for the exchange of information (such as
14 HTML documents, and client requests for such documents) between a browser
15 and a Web server. HTTP includes a number of different types of messages
16 which can be sent from the client to the server to request different types of
17 server actions. For example, a "GET" message, which has the format GET
18 <URL>, causes the server to return the document or file located at the specified
19 URL.

20 URL (Uniform Resource Locator). A unique address which fully
21 specifies the location of a file or other resource on the Internet or a network.
22 The general format of a URL is protocol: //machine address:port/path/filename.

23 User Information. User information is identification and security
24 information used in accessing imaging composition(s) and imaging data
25 associated with a particular user profile. It is preferably accessed either
26 directly or indirectly through methods provided by an extension component
27 integrated into the web browser.

1 PDA (Personal Digital Assistant). A small hand-held computer
2 used to write notes, track appointments, email and web browser with generally
3 with far less storage capacity than a desktop computer.

4 Personal imaging repository. A personal imaging repository is a
5 conceptual term describing the exchange infrastructure used to exchange
6 imaging composition and imaging data with web services. Users are associated
7 with their imaging data through user profiles.

8 DETAILED DESCRIPTION

9 Broadly stated, the present invention is directed to an improved
10 system and method for providing a history list of existing imaging
11 compositions that can be reactivated. The system and method allow existing
12 imaging compositions to be retrieved for later usage, which avoids unnecessary
13 user time to compose the imaging composition when the user simply wants to
14 resend it. In addition, the present invention provides a history record of the
15 existing imaging compositions for easy user reference.

16 Turning now to the drawings and particularly FIG. 1, a client-
17 server network system in which the present invention can be implemented is
18 shown and indicated generally at 10. A client machine 12 is connected to a
19 first server machine 14 and a second server machine 16 via a network 18.
20 Although two server machines 14, 16 are shown as examples, the preferred
21 implementation would likely involve many server machines to which the client
22 machine can access and communicate. The network 18 functions primarily
23 allow the server and the client to communicate and transfer data, preferably but
24 not necessarily using real time communication.

25 The Internet is the preferable network connection 18 because it
26 provides a very flexible and universal way of communicating. However, the

1 present invention can be implemented practically in any number of ways,
2 ranging from a large scale network to a standalone personal computer, that may
3 also change with evolving technology. To further the complexity of the
4 various network types that may be available, issues of bandwidth, reliability
5 and security of the network are important considerations. As a result, an
6 explanation of the current preferred embodiment of the network topology is
7 given as an example and other networks and connections are contemplated and
8 within the scope of the present invention. In addition, for better readability, a
9 client machine or server machine will be sometimes referred to. However, it
10 should be understood that the use of "a" also refers to "one or more."
11 Similarly, any references of imaging data or an imaging composition should be
12 understood to mean one or more.

13 The client machine 12 includes a browser 20, a personal imaging
14 repository 22, a display device 24 (e.g., a CRT monitor) and a user input device
15 26 (e.g., a keyboard and/or mouse). The personal imaging repository 22
16 includes a composition store 28 for storing imaging composition(s) of the
17 imaging data that are serviced as a single unit and an imaging data store 30,
18 i.e., digital memory, for storing the imaging data. An imaging composition
19 preferably comprises links to the imaging data that are serviced as a single unit,
20 which can be located at another web service's site. As a result, the composition
21 store 28 stores only the imaging compositions. It is also preferred that a history
22 list 31 of the existing imaging compositions is stored in the composition store.
23 The imaging data store 30, on the other hand, is any imaging data store located
24 on any computer that contains the imaging data. More specifically, each web
25 service can have its own imaging data store available to the public.

26 For example, at some earlier time, a user may print an article
27 from a web service site, resulting in an imaging composition being created and

1 stored in the user's composition store 28. The imaging composition contains
2 only the link to the imaging data for this article stored on the web service site.
3 Consequently, the imaging data for the article is not in the imaging data store
4 30 located on the imaging client 12. Rather, the imaging data is stored in the
5 imaging data store 30 located on the web service site. Of course, users will
6 have an imaging data store 30 that belongs to their user identification where
7 they can store imaging data, which is the imaging data store shown in the
8 imaging client 12. As a result, the term "personal imaging repository" 22 is
9 meant as a conceptual term for an exchange infrastructure between the imaging
10 data and the available web services on the Internet. Similarly, the term "web"
11 denotes millions of distinct servers that comprise the web. However, the web
12 does not actually do anything itself. Similarly, the servers serving the
13 composition store 28 and the imaging data store 30 are physical
14 implementations of the personal imaging repository as a concept.

15 The composition store 28 also stores the history list 31 including
16 the existing imaging compositions, which can be retrieved by a web service at a
17 later time. Additionally, the browser 20 includes an extension component
18 (extension) 32, which accesses user information for associating a particular
19 user profile to the personal imaging repository, provides an interface between
20 content executing in the browser 20 and the personal imaging repository 22.

21 It should be noted that the user profile can associate different
22 users or groups to the personal imaging repository. For example, the user
23 profile can associate a single user to a particular personal imaging repository,
24 but, at the same time, this user can also have multiple user profiles, resulting in
25 multiple personal imaging repository associated to a single user. Alternatively,
26 the user profile can associate a group having multiple users to a particular
27 personal imaging repository. The personal imaging repository, in this scenario,

1 can be used by a group having a common association, such as a group project.
2 As described, the user profile can be defined with great discretion and
3 flexibility, and these other implementations are contemplated and within the
4 scope of the present invention.

5 The first server machine 14 includes a first server 34. When the
6 browser 20 of the client machine initiates a send request to the first server 34, a
7 first content 36 is served by the first server to the browser. Each content 36 is
8 preconfigured with specific instructions depending on the type of service the
9 server machine serves. Similarly, the second server machine 16 includes a
10 second server 38 with a second content. The servers can provide any kind of
11 services. For example, a server can provide a peripheral device for the user to
12 print their imaging composition. On the other hand, the server can be an
13 auction web site, such as ebay.com, which makes an auction page for the user
14 when a graphic file is printed to the web site. As one can see, the type of
15 services and/or devices the servers can offer is limitless. In the present
16 invention, the user can "print" to any one of services. As a result, the use of the
17 word "print" is intended to be given a very board definition, which can be used
18 with many available devices or services. Whatever the services and/or devices
19 the servers provide, the content can include the instructions needed for the
20 configuration.

21 It should be noted that the personal imaging repository 22 can
22 represent any type of data storage device. In fact, the personal imaging
23 repository 22 does not necessarily have to be located with the client machine.
24 The personal imaging repository 22 can be located, for example, on another
25 server machine that the client machine can access through the Internet or a
26 Intranet. Although it is preferred currently to include the personal imaging
27 repository 22 with the client machine 12, this would likely change as the

1 bandwidth becomes faster and the popularity of the personal digital assistant
2 ("PDA") increases. However, these alternative implementations that are more
3 fitted for faster bandwidth and PDA are contemplated and should be considered
4 within the scope of the present invention. One preferred embodiment that is
5 more tailored to faster bandwidth or any client machine with limited storage
6 capacity is shown in FIG. 2.

7 A second client-server network system is shown in FIG. 2, and
8 indicated generally at 42. In this implementation, multiple users 44, 46 can
9 utilize the same client machine 48 through a communication link 50, such as
10 the Internet. Similar to the previous implementation, the client machine 48
11 includes a display device 52 (e.g., a CRT monitor) and a user input device 54
12 (e.g., a keyboard and/or mouse). However, unlike the previous server-client
13 system 10, the personal imaging repositories 56, 57 are included on a second
14 computer 58 (i.e., store server), which can also be a server computer or just a
15 linked personal computer. Users 44, 46 are assigned profiles for accessing the
16 personal imaging repository 56, 57 that belongs to them. For example, as
17 shown in FIG. 2, user 44 will have access to the personal imaging repository
18 56, and user 46 will have access to the personal imaging repository 57. In each
19 personal imaging repository 56, 57, there is preferably an imaging data store
20 (not shown) and a composition store 60, 62 that stores the history list 63, 64.

21 Preferably, a first user 44 accesses the personal imaging
22 repository 56 according to user information that is associated with a particular
23 personal imaging repository that belongs to this first user. Once the first user
24 has access to the composition store 60 of the personal imaging repository 56,
25 the history list 63 can be retrieved by the user. Similarly, a second user 46 has
26 access to the personal imaging repository 57 according to the user information
27 that is associated with the second user's personal imaging repository.

1 Consequently, the history list 64 that is stored in the second user's composition
2 store 62 can be retrieved through the browser. In this implementation, users
3 can access their history list from any computers that can access the same
4 communication link. Since the Internet is the preferred communication link, it
5 is possible for users to access these history lists and image data using a
6 standard PDA and/or wireless web phone. In turn, the users can retrieve
7 existing imaging compositions to request services from the first server 65
8 and/or the second server 66.

9 An exemplary display image of the history list is shown in FIG. 3
10 and indicated generally at 68. In the present invention, the history list can be
11 retrieved by any of the web services for user usage. Furthermore, since each
12 web service can provide different content depending upon the services that the
13 web service provides, there may be a variety of options that can be included
14 once the history list is displayed. However, since the configurations and
15 services offered by these web services are outside the scope of the present
16 invention, FIG. 3 is shown only as an example of how the history list can be
17 retrieved for later usage.

18 In this example, a user name is indicated somewhere in the
19 display image of the history list, since each history list is associated with user
20 information associated with the personal imaging repository assigned to a
21 particular user name. As shown, there are eight imaging compositions in this
22 exemplary history list, and an imaging composition is currently selected from
23 the list, specifically imaging composition 9. As shown, the user has multiple
24 options once the imaging composition is selected. In this example, the user has
25 the option of opening and/or printing the selected imaging composition. In
26 addition, there is also a help option in case the user needs help using the history
27 list.

1 Because the imaging composition is designed to include
2 information relating to image data sent as a single unit, which can have
3 multiple image data, the preferred embodiment of the imaging composition is
4 to include only information on instructions and link references for these image
5 data. Consequently, each actual image data may be stored in other locations
6 having a different Uniform Resource Locators ("URL").

7 An example display of the image data from a selected imaging
8 composition is shown in FIG. 4, which is indicated generally at 70. In this
9 example of the selected imaging composition, which was briefly discussed
10 previously, there are three image data that were previously composed and sent
11 as a single unit. The user writes a letter (letter image) 72 in a word processor,
12 and a company letter logo (letterhead image) 74 is added to the letter. Then,
13 the user accesses a website where postage for a package delivery can be
14 purchased, the postage (the postage image) 76 can then be printed and taped to
15 the package for delivery. As the United States Postal Office becomes more
16 sophisticated with computers, stamps can already be purchased over the
17 Internet.

18 In this given scenario, the user purchases the postage (postage
19 image) 76 needed for the letter and adds it to the letter (letter image) 72. As the
20 last step, the user sends all three image data (letter image 72, letterhead image
21 74, and postage image 76) as a single unit to another website service that will
22 print and mail this letter for the user. When the user sends these image data as
23 a single unit, an imaging composition will be created and stored in a history
24 list, which can be revisited by the user at a later time.

25 The manner in which the history list is maintained is shown in the
26 flowchart of the preferred subroutine of a history list maintenance process in
27 FIG. 5, indicated generally at 80. The history list maintenance process is

1 initiated by a request for adding a new imaging composition from a network
2 service (block 82). The network service first requests connection to the
3 personal imaging repository that is associated with user information accessed
4 by the extension component of the browser (block 84). It is next determined
5 whether the connection with the network service is successful (block 86).
6 When the connection is not successful (block 86), an error message will be
7 returned to the user (block 88). If, however, the connection is successful, the
8 network service accordingly sends a new imaging composition to the
9 composition store (block 90).

10 After the composition store receives the new imaging
11 composition (block 92), the new imaging composition will be saved in the
12 composition store (block 94). Next, the composition store determines whether
13 a predefined maximum number of existing imaging compositions are already in
14 the history list (block 96). A predefined maximum number of imaging
15 compositions is preferred in order to make the history list more manageable.
16 Otherwise, there could be too many imaging compositions in the history list
17 resulting in inefficient and ineffective usage of the list. If the predefined
18 maximum number of imaging compositions are already in the history (block
19 96), the oldest imaging composition will be deleted from the list (block 98).
20 Once there is space in the history list, the new imaging composition will be
21 added to the list (block 100). The composition store then terminates the
22 connection with the network service (block 102) to end the process.

23 It should be noted there are a wide array of ways to implement
24 the maintenance of the history list. For example, other criteria to control the
25 size of the list can be used. Furthermore, the system can also be configured to
26 give users the option to choose and set up their own criteria. One example is to
27 implement a criterion using the maximum lifetime of the compositions (e.g.,

1 compositions older than 10 days will be deleted). Similarly, another example
2 may be to implement a criterion based on the combination of the maximum
3 number in the list and maximum lifetime of the compositions (e.g., delete
4 compositions older than 10 days but keep at least 5 compositions and no more
5 than 12 compositions). In fact, the criteria can also be persistence (e.g., never
6 automatically delete the compositions). These other implementations are
7 contemplated, and should be considered to be within the scope of the present
8 invention.

9 A flow chart of the preferred subroutine of a request for the
10 history list process is shown in FIG. 6 and indicated generally at 104. This
11 process is generally initiated by a network service request for the history list
12 (block 106). The network service first requests a connection with the
13 composition store (block 108). It is then determined whether the connection
14 with the network service is successful (block 110). Again, if the connection is
15 unsuccessful (block 110), an error message will be returned to the user to
16 indicate the failed connection (block 112). Once a connection is established
17 (block 110), the network service will accordingly request the history list from
18 the composition store (block 114), which is provided to the network service
19 (block 116). At this point, the composition store will terminate the connection
20 with the network service (block 118), and end the process.

21 From the foregoing description, it should be understood that an
22 improved system and method for providing a history list of existing imaging
23 compositions has been shown and described, which has many desirable
24 attributes and advantages. The system and method can allow users to retrieve
25 existing imaging compositions from the history list. In addition, users also
26 have a record of their imaging composition history for reference, which may be
27 helpful for keeping track of the user's previous actions. The present invention

1 allows users to easily access existing imaging compositions, which may
2 otherwise take unnecessary user time to recreate.

3 While various embodiments of the present invention have been
4 shown and described, it should be understood that other modifications,
5 substitutions and alternatives are apparent to one of ordinary skill in the art.
6 Such modifications, substitutions and alternatives can be made without
7 departing from the spirit and scope of the invention, which should be
8 determined from the appended claims.

9 Various features of the invention are set forth in the appended
10 claims.